REMARKS

Claims 1-14 are pending. By this amendment, the specification is amended; claims 5 and 12 are amended; and the abstract is amended. Reconsideration in view of the above amendments and following remarks is respectfully requested.

The abstract was objected to. The abstract has been amended in accordance with the suggestion of the Office Action. Reconsideration and withdrawal of the objection to the abstract is respectfully requested.

The listing of references in the specification was objected to. Filed herewith is an Information Disclosure Statement including the references listed in the Office Action.

Claim 11 was objected to under 37 C.F.R. §1.75(c). The objection is respectfully traversed.

The Office Action cites MPEP §608.01(n). That section states "Although 37 C.F.R. §1.75(c) requires the dependent claim to further limit a preceding claim, this rule does not apply to product-by-process claims." In addition, MPEP §2173.051(f) states that "A claim which makes reference to preceding claim to define a limitation is an acceptable claim construction which should not necessarily be rejected as improper or confusing under 35 U.S.C. §112, second paragraph. For example, claims which read: 'The product produced by the method of claim 1' or 'A method of producing ethanol comprising contacting amalose with culture of claim under the following conditions....' are not indefinite under 35 U.S.C. §112, second paragraph, merely because of the reference to another claim." Finally, MPEP §2173.05(p) states that "A product-by-process claim which is a product that defines the claimed product in terms of the process by which it is made, is proper." Accordingly, it is respectfully submitted that claim 11 is proper under 37 C.F.R. §1.75(c). Reconsideration and withdrawal of the objection to claim 11 under 37 C.F.R. §1.75(c) are respectfully requested.

Claim 6 was rejected under 35 U.S.C. §112, second paragraph. The rejection is respectfully traversed.

Claim 3 recites a first temperature controller constructed and arranged to regulate a temperature of the intermediate table. Claim 6, which depends from claim 3, recites that the first temperature controller maintains the intermediate table and the gas at a temperature substantially equal to a temperature of the substrate table.

As disclosed, for example on page 10, lines 22-25 and 28-30, the temperature of the intermediate table influences the temperature of the gas used in the gas bearing and the temperature of the gas influences the temperature of the substrate. The first and/or second controller maintain the intermediate table and the gas at a temperature substantially equal to the temperature of the substrate table. Accordingly, it is respectfully submitted that claim 6 is consistent with claim 3 and particularly points out and distinctly claims the subject matter which Applicants regard as their invention.

With respect claim 5, claim 5 depends directly on claim 1, not on either claim 3 or 6, and thus is not required to be "consistent" with either claim 3 or 5. As disclosed, for example, on page 10, lines 8-10, the gas source includes a controller for temperature control of the gas. Accordingly, it is respectfully submitted that claim 5 particularly points out and distinctly claims what Applicants regard as their invention.

Reconsideration and withdrawal of the rejection of claim 6 under 35 U.S.C. §112, second paragraph are respectfully requested.

Claims 1, 7, 8 and 10-14 were rejected under 35 U.S.C. §102(b) over Takizawa (U.S. Patent 5,471,279). The rejection is respectfully traversed.

Claim 1 recites a lithographic projection apparatus including a radiation system, a mask table, a substrate table provided with a substrate holder for holding a substrate, a projection system, a preparatory station comprising an intermediate table on which a substrate can be positioned before transfer to the substrate table, and a gas bearing generator.

The Office Action on page 4, paragraph number 4 states that Takizawa discloses a substrate table provided with a substrate holder for holding a substrate in column 1, lines 1o-11. Takizawa discloses, however, in the prior art shown in Figures 7-9 a conventional substrate supporting unit A including an attraction plate 51 which is a main body of the substrate supporting unit A. As shown in Figures 7, a substrate W is removed from a substrate storage rack R by a rotating transport hand H and transferred to the substrate supporting unit A. As disclosed in column 1, lines 64 through column 2, line 2, after the substrate W has been positioned on the attraction plate 51, substrate supporting unit A is transported into an exposure apparatus S. Accordingly, Takizawa does not disclose a substrate table provided with a substrate holder and an intermediate table on which a substrate is positioned before transfer to the substrate table as recited in claim 1, as Takizawa discloses a single substrate supporting unit A that receives the substrate W and is then transported into

the exposure apparatus S. Accordingly, Takizawa does not disclose or suggest a lithographic projection apparatus including a substrate table provided with a substrate holder and an intermediate table on which a substrate can be positioned before transfer to the substrate table and cannot anticipate or render obvious claim 1.

Claims 7, 8 and 10-14 recite additional features of the invention and are allowable for the same reasons discussed above with respect to claim 1 and for the additional features recited therein.

Reconsideration and withdrawal of the rejection of claims 1, 7, 8 and 10-14 under 35 U.S.C. §102(b) over Takizawa are respectfully requested.

Claims and 12 and 13 were rejection under 35 U.S.C. §102(b) over Leoff (U.S. Patent 3,603,646). The rejection is respectfully traversed.

Claim 12 recites a substrate preparing device including an intermediate table on which a substrate can be positioned before transfer to a substrate table in a lithographic projection apparatus, the intermediate table including a major surface provided with a plurality of apertures and gas bearing generator constructed and arranged to generate a gas bearing between the major surface and substrate located thereon, and an ionizer constructed and arranged to ionize the gas.

Leoff discloses a wafer transport system including an air slide 10 including a manifold 12 in the form of an imperforate casing 14 supporting a porous planar member or pavement 16 whose porosity is such that positive air pressure from an air source creates a form of air on an outer surface 20 of the porous member 16 which supports, in a frictionless manner, in an article such as a wafer 22 moving over the porous member 16. Leoff does not disclose or suggest, however, an ionizer construct and arranged to ionize the air. Accordingly, Leoff cannot anticipate or render obvious claim 12.

Claim 13 recites additional features of the invention and is allowable for the same reasons discussed above with respect to claim 12 and for the additional features recited therein.

Reconsideration and withdrawal of the rejection of claims 12 and 13 under 35 U.S.C. §102(b) over Leoff are respectfully requested.

Claim 2 was rejected under 35 U.S.C. §103(a) over Takizawa in view of Doley et al. (U.S. Patent 6,161,311); claims 3, 5 and 6 were rejected under 35 U.S.C. §103(a) over Takizawa in view of Tsutsui (U.S. Patent 4,720,732); claim 4 was rejected 35 U.S.C. §103(a)

over Takizawa; and claim 9 was rejected under 35 U.S.C. §103(a) over Takizawa in view of Ota (U.S. Patent 6,228,544). The rejections are respectfully traversed.

Claims 2-6 and 9 recite additional features of the invention and are allowable for the same reasons discussed above with respect claims 1, 10 and 12 and for the additional features recited therein.

Reconsideration and withdrawal of the rejection of claims 2-6 and 9 under 35 U.S.C. §103(a) are respectfully requested.

In view of the above amendments and remarks, Applicants respectfully submit that all of the claims are allowable and that the entire application is in condition for allowance.

Should the Examiner believe that anything that further is desirable to place the application in better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,

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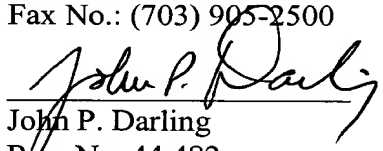

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JSB:JPD/tmt
Attachments:
Appendix (pp. 12-17)
Information Disclosure Statement
PTO 1449
Cited References

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APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

The specification is changed as follows:

Page 3, the whole paragraph starting in line 32 is changed as follows:

The gas used in the gas bearing can be air and the gas source can be provided with a filter [means] for [filtering] the gas (e.g. air from outside) such that it is substantially free of foreign particles. Alternatively, other gases can be used, for example, nitrogen or helium. As will be appreciated by the skilled artisan, one can control the gas bearing by having apertures for the inflow of gas to the gas bearing and also apertures for the evacuation of gas from the gas bearing. A particular pressure for the inflow of gas may be between about 1.1 and 1.5 bar whereas a reduced gas pressure for the evacuation of the gas may be between about 0.5 and the 0.9 bar, for example. The gas bearing may have a thickness less than about 150 μm, for example.

Page 4, the whole paragraph starting in line 8 is changed as follows:

The preparatory station can comprise a gas [ionizing means] ionizer to ionize the gas used to create the gas bearing. By using the gas [ionizing means] ionizer the substrate can be gradually discharged from any initially charged state (since a statically charged part of the substrate will attract ions with an opposite charge, so that the charged part will be neutralized by the ions). This gradual discharging is advantageous, because it prevents a sudden discharge of the substrate, e.g. if it comes into the neighborhood of a conductor. A sudden discharge, for example with a spark, can cause damage to the substrate or to the sensitive structures already created thereon. As will be appreciated by [the skilled artisan] one of ordinary skill in the art, the gas [ionizing means] ionizer can, for example, employ radioactive ionization or corona discharge to ionize the gas; corona discharge in a method applying a high voltage to a sharp point to ionize the gas in the vicinity of [said] the point.

Page 4, the whole paragraph starting in line 19 is changed as follows:

The intermediate table can comprise a first [control means for controlling] controller to control the temperature of that table. By controlling temperature of the intermediate table, the temperature of the substrate can be influenced. A first possible mechanism for effecting such influence can be thermal radiation from the substrate to the intermediate table. A second mechanism can be that the temperature of the intermediate table influences the temperature of the gas used in the gas bearing, and the temperature of the gas influences the temperature of the substrate. Especially when the gap caused by the gas bearing between the substrate and the surface of the intermediate table is very thin, the temperature of said table can have a strong and rapid influence on the temperature of the substrate.

Page 4, the whole paragraph starting in line 28 is changed as follows:

The preparatory station can comprise a second [control means for regulating] controller to regulate the temperature of the gas used in the gas bearing. By directly regulating the temperature of said gas, the temperature of the substrate can be influenced as well. Especially when the gap between the substrate and the intermediate table is large, it may be desirable to regulate the temperature of the gas directly instead of by regulating only the temperature of the intermediate table.

Page 5, the whole paragraph starting in line 1 is changed as follows:

An advantage of the invention as described above is that said first and second [control means] controllers can maintain the intermediate table and the gas at a temperature substantially equal to the temperature of the substrate table (e.g. as measured using temperature sensing means in the substrate table). In that case the temperature of the gas and the intermediate table will change the temperature of the substrate to a temperature substantially equal to the temperature of the substrate table. After the substrate is provided to the substrate table the temperature of the substrate will not change significantly anymore, and therefore no substantial expansion or shrinkage of the substrate will occur on the substrate table. Accordingly, the chance that a slip of the substrate on the substrate table will occur can be minimized when these measures are taken.

Page 8, the whole paragraph starting in line 19 is changed as follows:

The beam PB subsequently intercepts the mask MA which is held in the mask holder on the mask table MT. Having passed through the mask MA, the beam PB passes through the projection system PL, which focuses the beam PB onto a target area C of the substrate W. With the aid of the [interferometric displacement and measuring means] interferometer IF, the substrate table WT can be moved accurately, e.g. so as to position different target areas C in the path of the beam PB. Similarly, the mask table MT can be positioned very accurately with respect to the beam PB. In general, movement of the mask table MT and the substrate table WT will be realized with the aid of a long stroke module ([course] coarse positioning) and a short stroke module (fine positioning), which are not explicitly depicted in Figure 1. In the case of a waferstepper, as opposed to a step-and-scan device, the mask table MT may only be moved with a short stroke module, or may be just fixed.

Page 9, delete the whole paragraph starting in line 21 and replace it with the following new paragraph:

- a rotation unit 15 comprising an actuator 17 and vacuum [holding means] holder 19 for holding and rotating the substrate 1 above the intermediate table 5;

Page 9, delete the whole paragraph starting in line 28 and replace it with the following new paragraph:

The substrate 1 will be moved to the intermediate table 5 by a substrate transporter, e.g. a robot arm. In general, the substrate is held on the backside 1b or the edge 3 by the substrate [transporting means] transporter, because on the front side 1a sensitive structures already created on the substrate 1 can be present. The substrate [transporting means] transporter will hold the substrate 1 above the major surface 11, and the vacuum holder 19 will be moved by the actuator 17 toward that surface 11 up to the backside 1b in a direction perpendicular thereto. A vacuum is applied to the vacuum holder 19, such that the backside 1b of the substrate 1 is sucked to the vacuum holder 19. The substrate transporter is then released from the backside 1b of the substrate 1 [are] and moved away from the major surface 11. The actuator 17 retracts the [holding means] holder 19 towards the major surface 11 in a direction substantially perpendicular to that surface 11, and gas is supplied to that surface 11 by the gas source 21 via the tube 23, the gas chamber 7 and the apertures 9. The gas creates a gas bearing between the substrate 1 and the major surface 11.

Page 10, the whole paragraph starting in line 8 is changed as follows:

As shown in figure 2b the gas source 21 can comprise a pump 31, gas ionizer 33, second controller 35 for temperature control of the gas, gas filter 37 and an air inlet 39. If the gas bearing is created with air, [said] the air will enter the gas source 21 through the air inlet 39 and will be filtered by gas filter 37 so as to make the air substantially free of foreign particles. Thereafter the air will be brought to a required temperature by second controller 35, ionized by [ionizes] ionizer 33, brought to a required pressure by pump 31 and delivered through the tube 23 to the intermediate table 5. If a gas other than air is used the filter 37 and the inlet 39 may be absent. Gases such as nitrogen and helium can be used for this purpose. The gas [ionizes] ionizer 33 ionizes the gas used to create the gas bearing. The ions in the gas will be attracted by any static charge collected on the backside 1b of the substrate 1, and will neutralize such charge.

Page 11, the whole paragraph starting in line 4 is changed as follows:

In measuring the orientation of the substrate 1 on the intermediate table 5 the mark detector [detecting means] 29 can be used to detect a mark on the front side of the substrate 1a, and/or the edge [detecting means] detector 27 can be used to detect the edge 3 of the substrate 1. The edge detector 27 measures the eccentricity of the substrate 1 on the intermediate table 5. This is accomplished by the actuator 17 which rotates the vacuum holder 19 around an axis perpendicular to the plane of the intermediate table such that the edge 3 of the substrate 1 rotates underneath the edge detector 27 (see Fig. 2c, which shows a plan view of the intermediate [plane] table 5 without a substrate positioned thereon). The edge detector 27 can employ a capacitive sensor or an optical sensor (e.g. a camera system or a CCD array) to measure the position of the edge 3 of the substrate 1. In this way:

Page 11, the whole paragraph starting in line 16 is changed as follows:

It can be determined if the [said] eccentricity of the substrate 1 upon the table 5 exceeds a threshold value which, when translated to the substrate table WT, would cause the substrate 1 to fail outside the capture range of the alignment module employed at the substrate table WT.

Page 12, the whole paragraph starting in line 17 is changed as follows:

Figure 4 shows a fourth embodiment of the invention in cross section. In this embodiment the gas bearing is relatively thick (i.e. larger than 150 μm). Gas will be supplied to the gas bearing from the gas source 21 through the tube 23, the gas chamber 7 and the apertures 9. If such a gas bearing is used the gas source 21 will advantageously be equipped with a second [control means] controller for directly controlling the temperature of said gas.

IN THE CLAIMS:

Claims 5 and 12 are amended as follows:

5. (Twice Amended) An apparatus according to claim 1 wherein said preparatory station comprises a [second] temperature controller constructed and arranged to regulate a temperature of said gas.

12. (Twice Amended) A substrate preparing device comprising an intermediate table on which a substrate can be positioned before transfer to a substrate table in a lithographic projection apparatus;

the intermediate table comprising a major surface provided with a plurality of apertures, and a gas bearing generator constructed and arranged to generate a gas bearing between said major surface and a substrate located thereon; and

an ionizer constructed and arranged to ionize the gas.

IN THE ABSTRACT OF THE DISCLOSURE:

The Abstract is changed as follows:

A lithographic projection apparatus[, comprising:] includes a radiation system [for supplying] to supply a projection beam of radiation; a mask table provided with a mask holder [for holding] to hold a mask; a substrate table provided with a substrate holder [for holding] to hold a substrate; a projection system [for imaging] to image an irradiated portion of the mask onto a target portion of the substrate; and a preparatory station comprising an intermediate table [5] on which a substrate [1] can be positioned before transfer to the substrate table; [characterized in that] the intermediate table [5 comprises] including a major surface [11] provided with a plurality of apertures [9], and gas bearing [means for generating] generator that generates a gas bearing between [said] the major surface [11] and a substrate [1] located thereon.

End of Appendix.